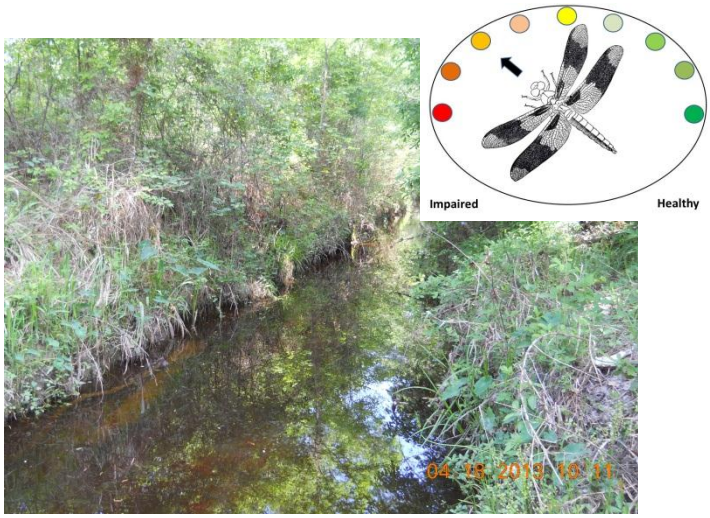
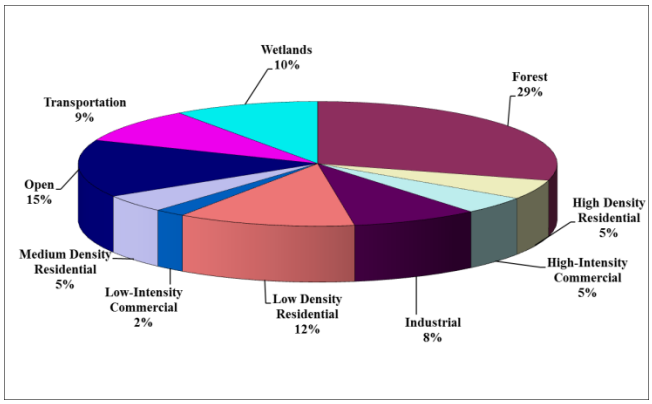
Waterbody: Gum Creek





Basin: Lake Munson

The urbanized Gum Creek system is located in central Leon County. Gum Creek meanders south through several wetlands, and eventually flows into Munson Slough.

As shown in the following pie chart, approximately 47% of the land uses in the 5,407 acre watershed is residential, commercial, industrial or transportation. Increases in stormwater runoff, and waterbody nutrient loads can often be attributed to these types of land uses.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (*e.g.,* recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

The Florida Department of Environmental Protection (FDEP) issued a fecal coliform TMDL for portions of Gum Creek in September 2008. The TMDL establishes the allowable loadings to the creek that would restore the creek to applicable water quality thresholds. In this case, fecal coliforms would have to be reduced by 32% to meet the criterion of fecal coliforms not exceeding 400 Most Probable Number (MPN) in 10 percent of the samples.

Methods

Surface water samples were collected to determine the health of Gum Creek and met the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

Tables 1 and 2 represent Gum Creek's annual geometric means of total phosphorus and total nitrogen. According to FDEP requirements, Numeric Nutrient Thresholds (expressed as an annual geometric mean) cannot be exceeded more than once in a three year period. Due to low water conditions, four temporally independent samples per year could not be collected from all stations during the period of record. The lack of data means that FDEP requirements for determining numeric nutrient criteria for some stations for several years

could not be calculated. Station GC1's total nitrogen levels exceeded the state criteria in 2006. Gum Creek total phosphorus levels did not exceed state criteria during the period of record.

Table 1. FDEP's total nitrogen criteria for streams applied to Gum Creek. Results in bold signify exceedances of the State criteria.

Gum Creek	Instream Protection Criteria				
	TN (1.03 mg/L)				
Year	**GC1**	**GC2**	**GC3**	**GC4**	**GC2T**
2005	0.69	0.63	0.53	0.69	-
2006	**1.10**	0.89	-	0.57	-
2007	-	-	-	**-**	-
2008	-	-	-	-	-
2009	0.66	-	0.53	0.77	0.59
2010	0.93	-	0.82	1.03	0.75
2011	-	-	-	-	-
2012	-	-	-	-	-
2013	0.68	-	0.66	-	-

Table 2. FDEP's total phosphorus criteria for streams applied to Gum Creek. All results were within the State criteria.

Gum Creek	Instream Protection Criteria				
	TP (0.18 mg/L)				
Year	**GC1**	**GC2**	**GC3**	**GC4**	**GC2T**
2005	0.05	0.05	0.10	0.15	-
2006	0.11	0.13	0.08	0.09	-
2007	-	-	-	-	-
2008	-	-	-	-	-
2009	0.06	-	0.05	0.08	0.05
2010	0.05	-	0.05	0.07	0.04
2011	-	-	-	-	-
2012	-	-	-	-	-
2013	0.04	-	0.06	-	-

Fecal Coliforms

Values continue to exceed the Class III criterion of fecal coliforms not exceeding the 400 Most Probable Number (MPN) (Figure 1) in 10% of the samples. This could possibly be the result of septic tank failures, sanitary sewer overflows, or wildlife activity.

Dissolved Oxygen (DO)

As Figure 2 shows, Gum Creek station GC2T periodically failed to meet to meet the Class III criteria for DO. Station GC4 did not meet the limit one time over the entire period of record. Due to beaver activity, the flow at station GC2T is often stagnant or flowing very slowly, leading to low DO levels.

Other Parameters

Chlorophyll *a* levels at Station GC2T (20 µg/L) were elevated during the October 2013 sampling event. Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

With the exception of Station GC1's total nitrogen levels exceeding the state criteria in 2006, Gum Creek met the nutrient thresholds in the East Panhandle Region. Station GC2T periodically failed to meet to meet the Class III criteria for DO. Station GC4 failed to meet the limit once over the entire period of record. Chlorophyll *a* levels at Station GC2T were elevated during the October 2013 sampling event. Other water quality parameters appear to be normal for the area and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and resources for more information

www.LeonCountyFL.gov/WaterResources

Click here to access the results for all water quality stations sampled in 2013.

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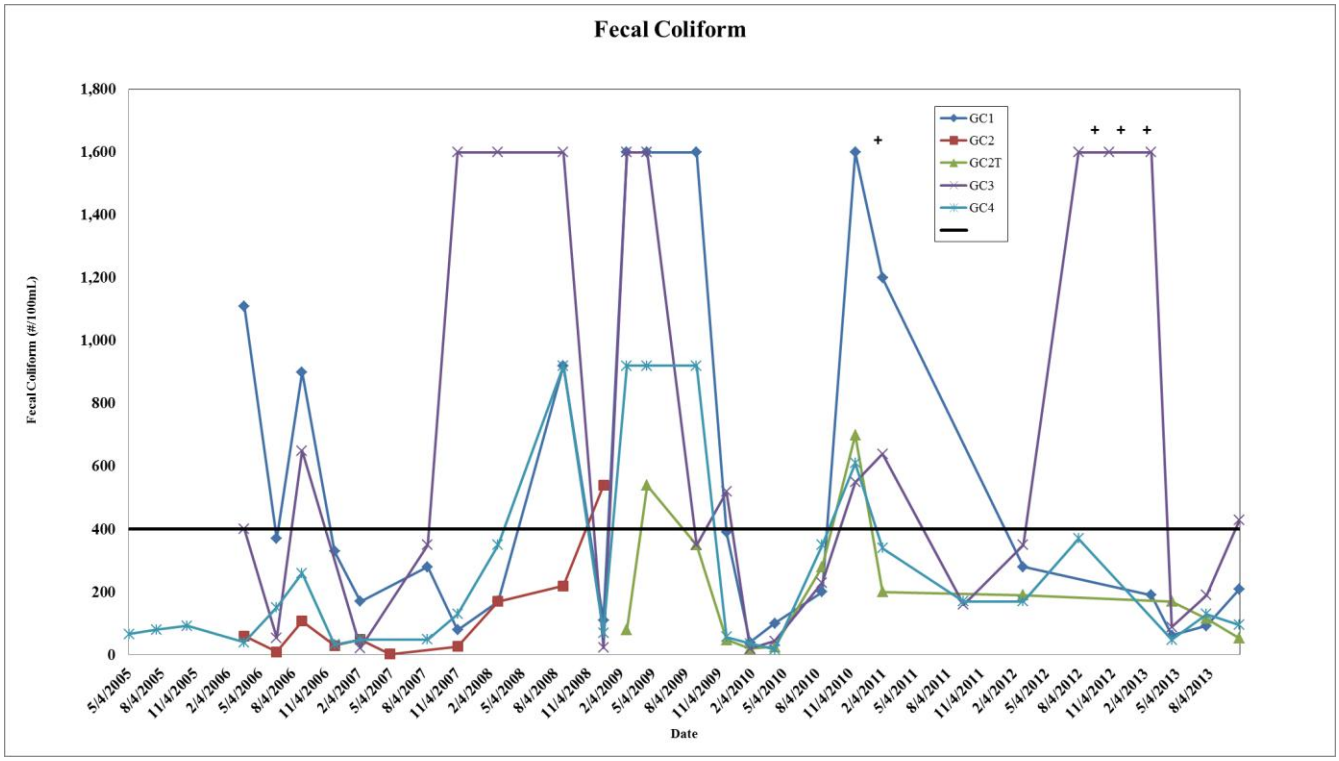

Figure 1. Fecal coliform results for Gum Creek. "+" signifies station report counts are actually greater than 1600.

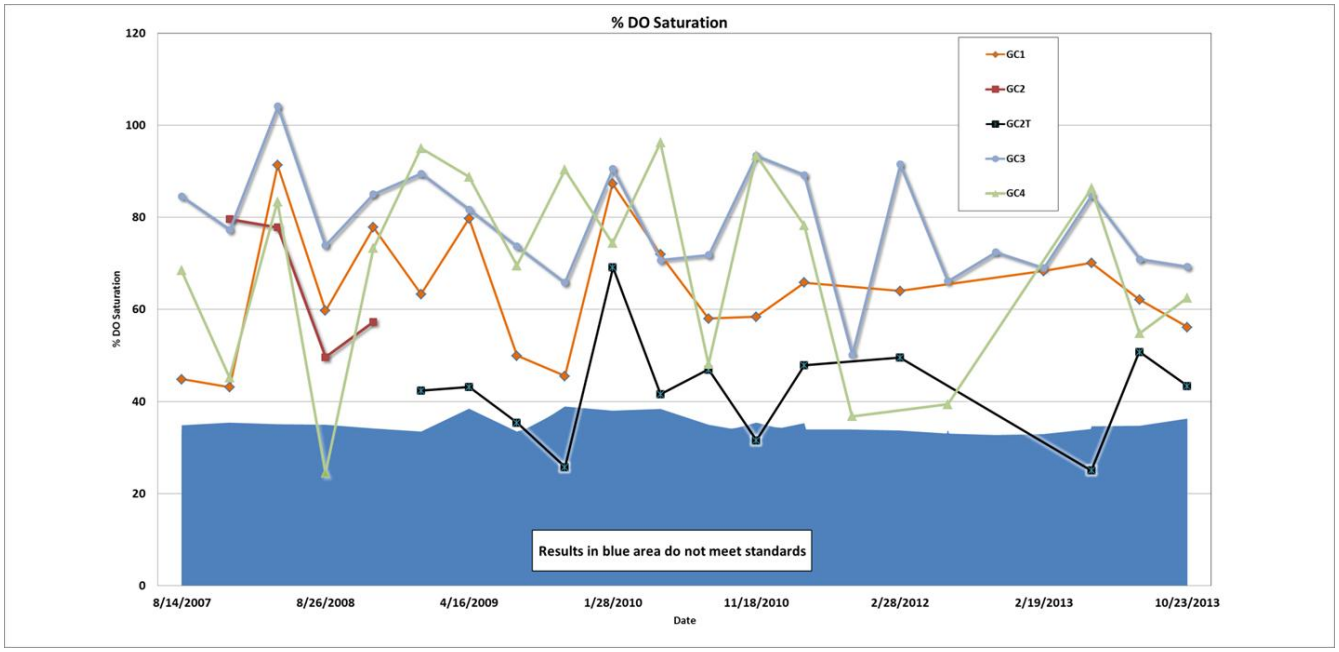

Figure 2. Dissolved Oxygen Percent Saturation results for Gum Creek.